

# HERBAL

# HERITAGE

## **ALOE VERA & TULSI**

**GRADE-VII**



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## **FOREWORD**

**The future belongs to those who learn more skills and combine them in creative ways.”  
— Robert Greene**

The new National Curriculum Framework (NCF) in line with the National Education Policy 2020 (NEP) focuses on making learning a joyful experience and remove stress from students, to develop a sense of self-reliance and dignity of the individual which would form the basis of social relationship and would develop a sense of nonviolence and oneness across the society. A child centered approach is the need of the hour to promote universal enrollment and retention as there is an emergence of new avenues and an entirely new set of demands are required. It is the time to reform our pedagogies by effecting a shift from learning by rote to improving knowledge retention by advocating practical application as stated in NEP 2020. We must endeavor to effect a decisive shift from education for all to quality education for all.

As it is precisely the time to bring reforms in education, everyone must make concerted efforts to redesign curriculum and be more open to work and embrace intuitive teaching techniques that increase student involvement in the learning process. The new learning and teaching practices must excite students and ignite their imagination.

The ‘Herbal Heritage’ is one such effort to make learning fun-filled and enable students know about our spices that have a range of health benefits. The students will strive to gain sufficient knowledge of concepts, language and have the will to innovate! Constructive learning has to be part of the curriculum. Situations and opportunities have to be created for students to provide students with challenges, encourage creativity and encourage their active participation.

I congratulate the Management, Principal, teachers and students of Delhi Public School Kamptee Road, Nagpur who successfully shouldered this responsibility and came up with this brilliant work which will give the student fraternity an opportunity to have fun-filled learning. I am also grateful to Princess Diya Kumari Foundation who mentored the facilitators for producing this phenomenal and astounding work. I would like to advise the students to continue to study and learn new skills and be persistent in their pursuit for expansion.

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# CLASSIFICATION OF PLANTS

**Learning objective-** Students will be taught about plants and their different categories.

**Learning outcome-** Students will be able to identify and name the plants according to the category they belong to.



Picture Credit: <https://images.app.goo.gl/>

Before we proceed to herbs let's first understand what actually herbs are and why are they called so?

We see a huge variety of plants around us. Among which few are terrestrial means that grow on land while those that grow in water are called aquatic plants. Despite this fact, they all have the same parts and the same functions but still they appear unique with different types of roots, stems, leaves, flowers, fruits, seeds, etc.

Therefore, the plants are further classified based on their height, tenderness of stem, branches and life cycle.

Let us know in detail about the classification of plants based on their growing habits. Before that, let us understand the term Growth Habit. Growth habit mainly refers to the appearance, shape, height, and form of growth of a plant species. A plant's growth habit develops from particular genetic patterns that determine growth.

## CLASSIFICATION BASED ON GROWTH HABITS

If we consider plants based on their height, some are too short while some are too tall to climb. Besides the height, stem thickness and delicacy also varies.

**For example**– Short plants have greenish, soft, and tender stems, while big and tall plants or trees have a thick, strong and woody stems that are hard to break.

Based on the growth habit, plants are broadly categorized into three groups:

## HERBS, SHRUBS AND TREES

### Herbs

The herb is a short-sized plant with a soft, green, delicate stem without woody tissues. They complete their life cycle within one or two seasons. Generally, they have few branches or are branchless. These can be easily uprooted from the soil. Herbs contain enough nutritional benefits, including vitamins and minerals, to make them a part of a healthy balanced diet. Tomato, wheat, paddy, grass and banana are a few examples of herbs.



Picture Credit: <https://images.app.goo.gl/>

### Shrubs

Shrubs are medium-sized, woody plants taller than herbs and shorter than a tree. Their height usually ranges from 6m to 10m tall. Their features include bushy, hard, and woody stems with many branches. Although stems are hard, they are flexible but not fragile. The life-span of these plants usually depends on the species. Rose, jasmine lemon, tulsi, and henna are some of the common shrubs around us.



Picture Credit: <https://images.app.goo.gl/>



Picture Credit: <https://images.app.goo.gl/>

## Trees

Trees are big and tall plants. They have very thick, woody and hard stems called the trunk. This single main stem or the trunk gives rise to many branches that bear leaves, flowers and fruits. Some trees are branchless like coconut tree; i.e., they have only one main stem which bears leaves, flowers, and fruits all by itself. The lifespan of the trees is very large. i.e. for several years.

Banyan, mango, neem, cashew, teak and oak are some examples of trees.

In addition to these three categories of plants, there are plants that need some support to grow. They are specifically called climbers and creepers.

## Climbers

Climbers are much more advanced than creepers. Climbers have a very thin, long and weak stem that cannot stand upright, but they can use external support to grow vertically and carry their weight. These types of plants use special structures called tendrils to climb. Some examples of climbers are pea plant, grapevine, sweet gourd, money plant, jasmine, runner beans, green peas, etc.



Picture Credit: <https://images.app.goo.gl/>

## Creepers

Creepers, as the name suggests, are plants that creep on the ground. They have a very fragile, long, thin stem that can neither stand erect nor support all their weight. Examples include watermelon, strawberry, pumpkin and sweet potatoes.

**Are herbs and spices same? What do you think?**

*Herbs are leafy things, like basil, thyme, and cilantro; and spices are seeds, either whole or ground, like coriander and cumin.*

## ACTIVITY

1. Categorize the following name in proper categories of herbs, shrubs, trees, creepers and climbers. Neem tree, lemongrass, cilantro, basil, lemon, mango, pumpkin, bitter gourd, wheat, maize and money plant.
2. List two differences between herbs and shrubs.
3. Give some examples of spices that we often use in our kitchen.

Column- I		Column- II	
A.	Tall and strong plants are called	(i)	climbers
B.	Plants which grow with the help of support	(ii)	Herbs
C.	Short and bushy plants are called	(iii)	Trees
D.	Plants which are very short and have soft stems are called	(iv)	Shrubs

4.

## GLOSSARY

1. terrestrial- on or relating to the earth
2. aquatic- an aquatic plant or animal, especially one suitable for a pond or aquarium
3. tenderness- gentleness and kindness
4. bushy- growing thickly
5. fragile- easily broken or damaged
6. trunk- the main woody stem of a tree

## Let us Recall

### A. Choose the correct option.

1. Small plants have \_\_\_\_\_ stem while big trees have \_\_\_\_\_ stem.
  - a. soft, hard
  - b. green, woody
  - c. hard, soft
  - d. both a and b
2. Shrubs are woody plants \_\_\_\_\_ than herbs.
  - a. taller
  - b. shorter
  - c. both taller and shorter
  - d. none of the above.

### B. Fill in the blanks.

<b>Herbs</b> <b>for several years</b>	<b>climbers and creepers</b> <b>very short</b>	<b>plants</b> <b>terrestrial</b>	<b>trees</b> <b>aquatic</b>
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1. Plants that need support are called \_\_\_\_\_ and \_\_\_\_\_.
2. Plants have very thick woody stem called \_\_\_\_\_.
3. The lifespan of trees is \_\_\_\_\_.
4. The plants that grow on land are called \_\_\_\_\_ while those growing in water are called \_\_\_\_\_.

### C. State whether statements are true or false.

1. The plants that do not need support are called climbers. \_\_\_\_\_
2. The trees have green and soft stem. \_\_\_\_\_
3. The shrubs are taller than herbs. \_\_\_\_\_



## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

# ALOE VERA





## **CHAPTER 1: INTRODUCTION THROUGH A STORY – ALOE VERA**

**Learning objectives-** Students will be introduced to the Asian herb Aloe vera.

**Learning outcomes-** Students will understand the use of herb in various cuisines.

### **A LIFE-LONG RELATIONSHIP WITH ALOE VERA**

I was arranging my wardrobe yesterday only to avoid being scolded by my mother. I could see the advertisement that was being aired on the TV channel. I saw the entire range of beauty products that lure the womenfolk. Honestly, I don't use any cosmetics as I feel that beauty lies in the eyes of the beholder. Every time I look in the mirror I ask him, "Mirror, mirror on the wall, tell me who is the prettiest girl of all?" And of course, I know the answer is ME. I don't use any skin products to make me look fair or beautiful, but yes I do use some cosmetics that are natural. I am using a skin care product for more than 5 years and now it has become a part of my daily routine. It is my favourite 'Aloe vera gel'. This gel works like magic on me.

I apply it on my face and neck every day after a bath and before going to sleep. It is really helpful to treat acne marks and gives me a clear and glowing radiant skin. It moisturizes my skin. My mother and my cousins have also started using this after seeing the good results on my skin.

Now you must be wondering what medicinal properties does Aloe vera which is also called Podha contain and how does Aloe vera gel benefit us? Let me tell you...

- Aloe vera gel reduces acne and also lightens blemishes.

Aloe vera gel fights aging. Aloe leaves contain a plethora of antioxidants that include vitamin C and vitamin E that helps to improve the skin's natural glow and also keep it hydrated.

- Aloe vera gel treats sunburn as it has antioxidant properties.
- Aloe Vera gel acts as a moisturizer as it prevents skin drying.
- It helps in relieving skin irritation.

**You can grow your own Aloe vera and get pure gel any time!**

## ACTIVITY

1. Do you know any other herb which has the similar properties as Aloe Vera? Name it and highlight its properties.
2. Has any of your family members used Aloe vera? In what ways?
3. Do you have Aloe vera in your garden? How do you use it?

## GLOSSARY

1. acne: a skin condition characterized by red pimples on the skin
2. blemishes: a small mark or flaw which spoils the appearance of something
3. plethora: a large or excess amount of something
4. antioxidant: a substance that inhibits oxidation
5. hydrate: cause to absorb water
6. moisturizer: a cosmetic preparation used to prevent dryness in the skin

## Let us Recall

### A. Choose the correct option.

1. Which product is the narrator using from 5 years?  
a) hair oil                      b) eyeliner                      c) perfume                      d) Aloe Vera gel
2. Where did the narrator see the entire range of beauty products?  
a) in her wardrobe                      b) in her kitchen                      c) in her school                      d) on the television

### B.Fill in the blanks.

1. The narrator's \_\_\_\_\_ and \_\_\_\_\_ started using Aloe vera after seeing the good results on her skin.
2. Aloe vera contains vitamin \_\_\_\_\_ and \_\_\_\_\_ which hydrates skin.
3. The \_\_\_\_\_ property of Aloe vera helps in treating sunburn.



## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

## **CHAPTER 2 : INTRODUCTION OF ALOE VERA**

**Learning objectives-** Students learn and understand about the origin of the Aloe vera and the various names by which it is known.

**Learning outcomes-** Students will know about the various names, origin and importance of Aloe vera.



Picture Credit: <https://en.wikipedia.org/>

**Plant name (Latin):** Aloe vera

**Plant family:** Asphodelaceae

**Native Region:** Asia, Africa, India, Arid regions

**Growing Habits:** Africa, India, Other arid regions

**Parts Used:** Leaves

**Extraction of Gel Method:** Centrifugation

### **HISTORY**

The origin and history of Aloe vera from its discovery in ancient times to the present day is a remarkable story and not one that many have heard despite being familiar with Aloe vera. Historically, we may never know when Aloe vera's wellness applications were first discovered as they likely predate written history. We know about it from the 6000-year-old carvings of the plant discovered in Egypt. Later, it became a common burial offering or gift to the deceased pharaohs as its remnants are found in the tombs. The first written record of Aloe vera's usage for medicinal purposes appeared in Sumerian hieroglyphic tablets circa 2200 BC during the Mesopotamia civilization which describes it as a laxative. Traditional herbal medicine practitioners and ancient physicians considered it a 'miracle plant' as it has many health benefits.

**Find out more information about some more 'miracle' plants found in your region.**

Wonderful!!

### **MORPHOLOGY**

So, what exactly does Aloe vera look like? You might be thinking it looks somewhat grass only. Aloe vera is an arid plant that survives in areas of low natural rainfall. Aloes are perennial succulents or xerophytes; they can adapt to habitats with low or erratic water availability, are characterized by the capacity to store large volumes of water in their tissue. It is a stem less or very short-stemmed plant growing to 60–100 centimeters (24–39 inches) tall, spreading by offsets. The leaves are thick and fleshy, green to grey-green, with some varieties showing white flecks on their upper and lower stem surfaces. The margin of the leaf is serrated and has small white teeth. The flowers are produced in summer on a spike up to 90 cm (35 in) tall, each flower being pendulous, with a yellow tubular corolla.

Mostly Aloe vera is cultivated in India and China.



## CHOOSING THE BEST ALOE VERA

*Barbadensis-Miller* is well established as the best Aloe species, for both topical and internal consumption.

The *Barbadensis-Miller-Stockton* plants do have white spots when they are pups – but the spots go away as the plant matures.

Another distinguishing feature is that the flower has yellow petals, with no stripes or dots on the petals.

## BOTANICAL AND COMMON NAMES OF ALOE VERA

**Scientific name**

*Aloe vera*

**Common Name**

barbadensis, grithkumari, gwarpatha.



Picture Credit: <https://www.pinterest.com>

## CHEMICAL COMPONENTS OF ALOE VERA

Aloe vera contains 75 potentially active constituents: vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acids and amino acids.



In which form is Aloe Vera consumed?

It is consumed in the form of juice while the gel is often applied topically.

Picture Credit: <https://mobile.twitter.com/>



Picture Credit: <https://aloderma.com/>

## ACTIVITY

1. How do you use Aloe vera in your family and for what purpose?
2. How are the chemicals extracted from Aloe Vera?

## GLOSSARY

1. arid: having little or no rain
2. laxative: Tending to stimulate or facilitate the evacuation of the bowels
3. serrated: having a jagged edge
4. topical: Applied directly to a part of the body
5. internal: situated inside the body

## Let us Recall

### A. Choose the correct option.

1. Aloe vera survives in areas of:  
a) low rainfall      b) high rainfall      c) moderate rainfall      d) heavy snowfall
2. Which part of the plant is used for commercial preparations?  
a) leaf      b) root      c) flower      d) seeds

### B. State whether the following statements are true or false. Correct the false statement.

1. *Barbadensis miller* is the best-known Aloe species for consumption. \_\_\_\_\_
2. Aloe vera is an arid plant. \_\_\_\_\_
3. The common name of Aloe vera is amarbel. \_\_\_\_\_

## SELF-REFLECTION

WHAT?	HOW?	WHY?

## **CHAPTER 3 : USES AND IMPORTANCE OF ALOE VERA**

**Learning objective-** Students will understand the importance and uses of Aloe vera.

**Learning outcome-** Students will be able to include Aloe vera in treating various problems related to skin, hair and stomach.

### **PARTS OF THE HERB USED:**

Gel, latex from leaves

#### **Which part of Aloe vera is edible?**

The gel or 'meat' of Aloe vera is edible.

#### **TRADITIONAL USES OF ALOE VERA:**

Aloe vera juice is extracted from the green outer leaf of the aloe Vera plant. It's made by crushing the plant and filtering out the liquid. Naturally, it tastes bitter and is slightly thicker than plain water.

Consuming Aloe vera juice may benefit your digestive tract and help to soothe and cure stomach diseases, including irritable bowel syndrome (IBS).

Aloe vera gel is a green jelly-like substance that is found inside the leaf and by breaking open the leaf, the gel oozes.

Aloe vera is often used to treat burns as its soothing, moisturizing, and cooling properties help relieve burn pains and also give relief and moisturize the burning part.

If your hair feels dry and rough, Aloe vera will come to the rescue. Grab your Aloe vera gel and smooth it over the hair strands to cover them well. Allow it to remain for 30 mins and wash off to reveal soft hair.

**I am sure you all must have somewhere seen this herb and even heard about its health and beauty benefits. Especially the girls must have felt inclined to use this magical plant to make them look fabulous!!**

### **HEALTH BENEFITS OF ALOE VERA**

Do we include it just for beauty benefits?

Not really. It does have some health benefits, which means if we can include it in our daily diet, we will surely get some good benefits out of it.



Picture Credit: <https://www.ndtv.com/food/>



Picture Credit: <https://langtreechiropractic.com/>



## WHAT DOES ALOE VERA CONTAIN?

### • Vitamins

Aloe Vera gel is packed with vitamins. It contains B-12, which helps make DNA, and also maintains blood and nerve cells. The gel contains folic acid, which makes new cells and prevents birth defects. It has choline, which transmits nerve impulses in the body and sends signals between the cells. It also contains vitamins A, C and E, which are antioxidants. Antioxidants protect cells against damaging free radicals, molecules that damage the cells and cause heart disease and cancer.

### • Minerals

Minerals are vital to humans, and they are found in aloe gel. The gel contains a minimum of nine minerals, which are needed to make enzyme systems and metabolism function properly. Among the important in Aloe Vera are calcium, zinc, selenium and magnesium, all essential for metabolic functions; and chromium, which enhances the insulin that provides cells with energy. It also contains copper, manganese, potassium, and sodium.

I am sure all of us have got some kind of injuries when we are asked to be careful with the germs and infections. Here comes Aloe Vera to your rescue!

## HOW DOES ALOE VERA SPEED UP THE HEALING PROCESS?

Aloe vera contains agents known to help inhibit fungi, bacteria, and viruses. It helps speed the healing of wounds, including first- and second-degree burns and also fights bacteria inside wounds.

Germany's regulatory agency for herbs – Commission E – approved the use of Aloe vera for the treatment of constipation. Dosages of 50-200 milligrams of Aloe latex are commonly taken in liquid or capsule form once daily for up to 10 days.

Aloe Vera has excellent antioxidant and anti-inflammatory properties. Anti-oxidants are substances that prevent or slow down the damage caused to cells by free radicals which are normally found in cigarette and air pollution as well.

Anti-inflammatory properties help to reduce redness, swelling and pain in the body. Stress and worries leave you constipated and have poor digestive health. Consuming Aloe vera juice may benefit your digestive tract and help to soothe and cure stomach diseases, including irritable bowel syndrome (IBS). A study showed that it significantly improved symptoms of IBS when compared to a placebo. No adverse effects were reported, though more research is needed using a larger study size.

Additionally, Aloe vera also stops the growth of bacteria, which is found in your digestive tract and can lead to ulcers.

## ALOE VERA - A FRIENDLY PLANT

Aloe vera is rich in nutrients, enzymes, and antioxidants that offer numerous benefits to us humans when used topically or ingested— including a boost to hydration, digestion, cell regeneration, wound healing, and more. Aloe vera can also be used as a 'natural fertilizer' to feed other plants!

## HOW TO MAKE AN ALOE VERA SOIL DRENCH?

It's incredibly simple to make homemade Aloe vera fertilizer to use as a soil drench. Essentially, all you have to do is toss some Aloe vera in a blender with water! If you're using fresh Aloe vera leaves, you don't even need to remove the skin or extract the inner gel.

Use about  $\frac{1}{4}$  cup to  $\frac{1}{2}$  cup of fresh Aloe vera per gallon of water total. A little goes a long way! Creating a smaller concentrated batch of Aloe vera in the blender and then further dilute it before applying it in the garden. So, calculate based on the *total volume* you plan to make. For example, we blend about 2 large Aloe vera leaves (or 4 – 5 small leaves) to make a 5-gallon bucket of finished Aloe vera fertilizer.

Before getting started, keep in mind that it is best to use homemade Aloe vera fertilizer within 20 minutes of mixing it. Once cut, processed, and exposed to air, fresh Aloe vera quickly ferments and begins to degrade.

- Cut the Aloe vera leaves into several chunks and add them to a blender half-full of water
- Next, pour the blended Aloe vera solution into a larger volume of water to dilute it to the desired concentration. We typically add one blender full of Aloe into one or two 5-gallon buckets of water.

### ACTIVITY

1. List some health benefits of Aloe vera.
2. List any two medicinal properties of Aloe vera.
3. Name some vitamins and minerals present in Aloe vera.
4. How does Aloe vera provide relief to the person suffering from injuries and burns?

### GLOSSARY

1. latex: a milky fluid found in many plants
2. edible: fit to be eaten
3. anti-inflammatory: the agent that reduces swelling and pain
4. constipation: A condition in which there is difficulty in emptying bowels
5. anti-bacterial: tend to prevent the growth of bacteria

## Let us Recall

### A. Choose the correct option.

1. Which part of Aloe vera is edible?  
i) root                                      ii) flower                                      iii) skin                                      iv) pups
2. Properties of Aloe vera  
i) anti-inflammatory                      ii) anti-bacterial                      iii) antioxidant                      iv) all of these

### B. State whether the following statements are true or false. Correct the false statement.

1. Aloe vera is used as a laxative for treating constipation. \_\_\_\_\_
2. Consuming Aloe vera roots help to cure skin diseases. \_\_\_\_\_
3. Aloe vera is used in biscuits. \_\_\_\_\_

## SELF-REFLECTION

WHAT?	HOW?	WHY?



## **CHAPTER 4: LET'S GROW ALOE VERA**

**Learning objective-** Students will learn what propagation is.

**Learning outcome-** Students will learn how to grow Aloe Vera.

Let's start propagating this herb by the steps given below.

But wait!

### **WHAT IS PROPAGATION?**

Propagation is the breeding of a plant by natural processes from the parent stock.

**How To Grow Aloe Vera at Home - Materials list:**

- *an Aloe Vera leaf*
- *a clay pot with large holes in it*
- *potting soil*
- *a watering device (such as a hose)*
- *a couple of fragments of broken pottery*
- *knife*
- *spoon*
- *You can gather all these things at a plant nursery and a gardening store.*

### **GROWING AND PLANT CARE:**

**1- Cut the leaf at the base using a sharp, clean knife.** Try to cut at a downward angle, towards the stem. The knife must be very clean, or you risk infecting the leaf.

**2- Leave the leaf someplace warm, long enough for a film to form over the cut part.** This can take as little a few days to as long as two weeks. This film will help keep the cut part from getting infected by the soil. An infected Aloe vera leaf won't survive for very long.

**3- Find a pot with a drain hole in the bottom.** Like most plants, Aloe Vera likes water, but it hates to sit in it. If your pot does not have a drain hole, the soil will stay soaking wet. This can lead to root rot, which can kill a plant—including the hardy Aloe vera.

**4- Fill the pot with cactus soil, and dampen it with water.** If you don't have any cactus soil, you can mix your own by mixing one part sand and one part potting soil.

**5- Stick the leaf cut-side-down into the soil.** Make sure that about one-third of the leaf is in the soil. The bottom leaves of the Aloe plant should rest just above the soil, too. Do not water after planting.

**6- Ignore your plant (temporarily).** After you've placed your aloe in its new pot, don't water it for at least a week. This will decrease the chance of inducing rot and give the plant time to put out new roots. Until the plant seems to be rooted and happy, keep it in a warm place that receives bright but indirect light.

**7- Give the plant adequate sunlight and warmth.** Aloe Vera plants prefer 8–10 hours of sunlight a day. While they grow best in warm or hot temperatures, they are capable of surviving cooler seasons in a more dormant state. However, they may suffer harm if exposed to temperatures below 25°F (-4°C).

## FERTILIZER AND MANURE

Any organic manure like farmyard manure is good for this herb. The best fertilizers to use are liquid 10-40-10 houseplant mixes designed specifically for succulents. Avoid granular fertilizers. If your aloe is in a container, water it thoroughly the day before feeding. This should flush out any lingering salts and reduce the risk of tip burn.



Picture Credit: <https://www.aloeveraaustralia.com.au>

### Weeding

Weeding is required only in the first plantation year, as unwanted plants keep reducing with each year.

### Managing Pests and Disease

Aloe vera is prone to be attacked by plant pests. Its fleshy thick leaves are a feast for multiple plant pests such as aphids, scale, mealy bugs and mites.

### How to get rid of a pest infestation?

Aloe vera plants are very sensitive and you should refrain from using any pesticides. If your Aloe has a pest problem it is best to use diluted rubbing alcohol.

Clean the leaves and the surface area of your plant and repeat it after about two weeks to make sure that any mealy bug, scale, aphid or whatever pest attacked your Aloe vera plant is completely gone.

Even using straight water to wash off your plants is a good way to get rid of unwanted insect infestations.

## ACTIVITY

1. Grow an Aloe vera plant and record your observations by listing:

Date of leaf sown

Type of soil used

pH of soil

Temperature

Humidity

Sunlight duration

Irrigation practices

Manure and fertilizers applied date and quantity

Care taken

## GLOSSARY

1. propagation: the process of increasing the number of plants
2. pest: a destructive insect that attacks crops
3. infestation: the presence of a large number of insects or animals in a place

## Let us Recall

### A. Fill in the blanks.

1. Aloe vera requires \_\_\_\_\_ hours of sunlight.
2. Aloe vera is infected by pests such as \_\_\_\_\_, \_\_\_\_\_.
3. After you've placed your Aloe in its new pot, don't \_\_\_\_\_ it for at least a week.

### B. State whether the following statements are true or false. Correct the false statement.

1. Aloe vera requires daily watering. \_\_\_\_\_
2. Aloe vera pests can be removed by rubbing leaves with alcohol. \_\_\_\_\_
3. We should refrain from using pesticides on Aloe vera. \_\_\_\_\_

## SELF-REFLECTION

WHAT?	HOW?	WHY?

## **CHAPTER 5 : HARVESTING AND POST-HARVESTING**

**Learning objective-** Students will learn techniques to harvest and store Aloe vera.

**Learning outcome-** Students will be able to harvest and store Aloe vera by freezing.

### **HOW TO HARVEST FRESH ALOE VERA GEL?**

#### **1. Trim the Aloe**

Choose a thick, long leaf from the bottom of the plant. Use a pair of sharp, clean scissors or a sharp knife to cut off the leaf as close to the trunk as possible.

#### **2. Let the Aloe drain**

Set the cut aloe leaf upright in a small jar or dish, with the cut side down. After a few minutes, you'll see a red or yellowish liquid draining out of the leaf. This is normal, and it is called aloin. This mucilaginous gel can cause stomach pain and diarrhoea, so give it about 10-15 minutes to drain out.

#### **3. Harvest the aloe gel**

Place the drained leaf on a clean cutting surface and carefully slice off the spiked edges with a sharp knife. Use the knife to carefully cut and lift the top of the green part away from the clear aloe flesh.



Picture Credit:

<https://www.ruralsprout.com>

If you have harvested more aloe leaves than you currently need, you can freeze Aloe Vera gel to use later. Recently, I had to harvest many leaves from my aloe plant as it was being transplanted to a new pot. Rather than let the bounty of my necessary harvest go to waste, I froze the gel.



Picture Credit:

<https://www.ruralsprout.com>

### **HOW TO FREEZE ALOE VERA GEL?**

Once you have sliced your Aloe free from the green leaves, add the slabs of clear gel to a blender. A few gentle pulses are all it takes to change the solid aloe gel into a more pourable state.



Picture Credit:

<https://learningherbs.com/>

Pour the gel into ice cube trays and place the tray into the freezer and let it rest until the cubes are solid.

### **SOME COMMON SIDE EFFECTS OF ALOE VERA**

Aloe vera leaves contain latex, which comes from underneath the plant's skin. Many people are allergic to latex, which can cause stomach issues like irritation, stomach cramps and low potassium levels. Increased amylase.

Consuming Aloe vera juice might cause your blood sugar levels to drop. It has laxative effect, which may increase the chances of electrolyte imbalance in diabetic patients. If you are a diabetic, it is better to consult a doctor before consuming Aloe vera juice.

The laxative effects of Aloe vera can lead to dehydration. Laxatives are generally used to alleviate constipation; however, if taken in more quantities than recommended, they may cause dehydration.



### Self Evaluation:

1. Aloe vera in India is commonly known as \_\_\_\_\_.
2. Aloe vera is propagated by \_\_\_\_\_.
3. Aloe vera gel is stored by \_\_\_\_\_ method.
4. List some side effects that are caused due to Aloe vera.
5. List down the steps to preserve and store Aloe vera by the freezing method.
6. Why is Aloe vera easy to grow?

### GLOSSARY:

1. mucilaginous: having a gelatinous consistency
2. diarrhoea: a condition in which faeces are discharged frequently and in liquid form
3. cramps: a painful involuntary contraction of the muscle
4. electrolyte: a liquid or gel which contains ions
5. alleviate: make a problem less severe

### Let us Recall

#### A. Fill in the blanks.

1. Aloe vera gel is stored by \_\_\_\_\_ method.
2. Red or yellowish liquid draining out of the cut leaf is called \_\_\_\_\_.
3. Consuming Aloe vera juice might cause your blood sugar levels to \_\_\_\_\_
3. Laxatives are generally used to alleviate \_\_\_\_\_
4. If you are a diabetic, it is better to consult \_\_\_\_\_ before consuming Aloe vera juice.
5. If you have harvested more Aloe leaves than you currently need, you can \_\_\_\_\_ aloe vera gel to use later.

## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

# TULSI



## CHAPTER 1- INTRODUCTION OF TULSI THROUGH A POEM

**Learning objective-** Students will be introduced to the herb - Tulsi through a poem.

**Learning outcome-** Students will be identify the Tulsi herb.

### POEM

The Holy Basil Leaf -Tulasi  
What is it in a leaf that stands out?  
The leaf is green in colour-  
So it is!  
Shapes and sizes may differ,  
But they are the heart –the live-wire

One thing is certain about a leaf,  
It can never change its colour!  
Whether a flowering plant or a dense hedge,  
Or leaves of tall, sturdy trees,  
Even the leaf of a forest grass;  
Leaves are ever steady and trustworthy,  
Never changing their shade,  
With the blow of the wind!

Look at a basil leaf!  
Is it different from other leaves?  
Or striking in appearance?  
Simple and unassuming,  
In its simplicity lies its beauty,  
The beauty of the egoless soul  
Yearning for the union  
With the divine soul!

Holy Basil -Tulasi  
The plant that grows in abundance,  
Tiny bell shaped flowers,  
A profusion of six bells at each point of the stalk,  
Twelve clusters lining up like a plume,  
No hues to marvel about,  
But with its humble nature  
Makes its presence felt!

Fragrant green leaves  
Ocimum sanctum – the black purple basil  
Ocimum album – the white basil,  
Plants that spread divine fragrance,  
The aroma of a loving heart,  
The aroma of tranquil mind,  
The fragrance of friendship and  
The fragrance of oneness!

A friendly village plant that mingles and merges  
And decorates the compound of every humble abode!  
The sacred basil grows in abundance  
For she has a generous heart  
To spread her fragrance around;

But this is no  
secret,  
All plants have  
green leaves!  
That enhances the  
whole plant!



She cultivates joy in her surroundings,  
To those who care for her  
She nourishes and rejuvenates with her inner power!

Matchless for its leafy essence  
The juice that can cure maladies,  
A wonder drug that can cure  
Ailments and diseases of varied kind  
A wellness plant!  
Basil can win the human hearts,  
Aid in the prayers of saintly men,  
And a great attraction for Gods as well!

Tulasi – the beloved of Krishna  
The divine player wears it around His neck  
Like a bright emerald necklace  
The sweet aroma envelopes Him  
As He plays his mellifluous flute!  
The melody of divinity  
Permeating its aroma  
Into woods, valleys and mountains  
And deep into the hearts of Gopis in Vrindavana!

A sin destroying plant  
If worshipped with ardent devotion.  
Tulasi – a powerful leaf  
That has the capacity to destroy  
The accumulated ‘karmas’ and ‘vasanas’.  
A rare plant that can liberate  
Many suffering souls from the clutches  
Of the cycle of birth, death and rebirth!

Give Krishna a choice of scented blossoms  
Like jasmine with its heady aroma,  
Or the pretty white chrysanthemum,  
Or the exotic parijata flower,  
Or the attractive red fluorescence,  
Krishna would pick up the green Tulasi leaves  
His favourite adornment – the leaves of devotion  
Holding it lovingly to his sacred heart!

Dr. Geeta Radhakrishna



## ACTIVITY

1. Which herb is the poet talking about?
2. Why is the herb considered as wellness plant?
3. Which God is associated with the tulsi herb?

## Let us Recall

**A. Choose the most appropriate option.**

- Which of the following best describes the shape of the tulsi flower?
  - Bell shaped
  - Oval shaped
  - Bowl shaped
  - Saucer shaped
- Ocimum sanctum is the scientific name of a variety of tulsi plants. What is the colour of this variety of herb?
  - White
  - Green
  - Black- purple
  - Green- purple
- Which of the following words is not used to describe the ‘Holy Basil- Tulasi’ in the poem?
  - Simple
  - Unassuming
  - Proud nature
  - Egoless
- The tulsi plant is matchless for its multiple uses. Which of the following is not one of its uses?
  - To get rid of pests
  - As a wellness plant
  - Used in prayers
  - To cure disease

**B. Fill in the blanks using the help words given in the box.**

Villages                  fragrance                  Ocium album

1. The scientific name of the white variety of basil is \_\_\_\_\_.
2. Tulsi leaves have a pleasant smell. From the poem the words that mean the same as 'aroma' is \_\_\_\_\_.
3. The sacred basil is found growing in most houses in \_\_\_\_\_.

**C. State whether the following statements are true or false. Correct the false statement.**

1. Tulsi is a very rare variety of herb.
2. Tulsi leaves are used for divine purposes. Tulsi herb is loved by Lord Krishna.

## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

## CHAPTER 2- TULSI: A HERB FOR ALL REASONS

**Learning objectives-** students learn and understand about holy herb tulsi, its name and origin and types.

**Learning outcomes-** Children will know the name, origin and types of tulsi.

### TULSI IDENTIFICATION

<b>Scientific Name:</b>	<i>Ocimum sanctum</i>
<b>Family:</b>	Lamiaceae
<b>Common Name:</b>	Holy Basil, Sacred Basil, Tulsi
<b>Plant Type:</b>	Perennial
<b>Variants:</b>	5 Variants (3 Common and 2 Rare). Krishna, Rama, Vana.
<b>Leaf:</b>	Small 2-4 cm long. Green or Purple in colour.
<b>Flower:</b>	Tiny, white or purple-pink flower
<b>Smell:</b>	Mild to strong sweet smell. It can smell sharp clove-like, especially in summer.
<b>Taste:</b>	Leaves of common Tulsi variety tastes a little sweet and bitter, something like clove



### MORPHOLOGY

Tulsi is a perennial, erect, hairy aromatic flowering herb or undershrub. It is an erect, much branched sub-shrub 30-60 cm tall, with simple opposite green or purple leaves that are strongly scented and hairy stems. Leaves have petiole and are ovate, up to 5 cm long, usually somewhat toothed. Flowers are purplish in elongate racemes in close whorls. The leaves of this plant on steam distillation yield a bright yellow colour volatile oil possessing a pleasant odour with an appreciable note of clove oil. The fruits are nutlets and produce numerous seeds.



### SCIENTIFIC AND COMMON NAMES OF TULSI

- Scientific name: *Ocimum sanctum* (2n=32) (Family: Lamiaceae formerly known as Labiatae)
- Local name: Sacred basil / Holy basil (English), Tulsi (Hindi, Gujarati, Sanskrit)
- It is also described as the 'queen of plants' and 'mother medicine of nature' due to its perceived medicinal qualities.

### ORIGIN



Tulsi is grown in the Uttar Pradesh region, located in northern India edging on the foothills of the Himalayas south of Nepal. Tulsi is believed to have originated here in North and Central India, but grows throughout the Indian subcontinent, Bangladesh, Eastern Nepal, China and much of Southeast Asia.

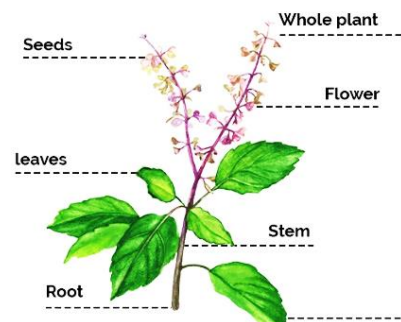


## TYPES OF TULSI

This holy basil has now escaped from cultivation and has naturalised into a cosmopolitan distribution.

The three main cultivated in India

1. Rama tulsi (*Ocimum sanctum*): Bright green leaves called Rama tulsi (the most common type, with broad bright green leaves that are slightly sweet)
2. Krishna tulsi (*Ocimum tenuiflorum*): Purplish green leaves called Krishna Tulsi or *Shyam tulsi*
3. Vana tulsi (*Ocimum gratissum*): Common wild Vana tulsi.



Picture Credit: <https://images.app.goo.gl/>

### Krishna Tulsi or Shyama Tulsi or Purple Leaf Basil

It is said that Krishna tulsi got its name because of the purple leaves as Lord Krishna's skin colour is dark according to the Vedas. Krishna tulsi is also famous for its crispy and peppery taste. Purple leaf tulsi is also used to treat throat infections, respiratory system, and skin diseases.



Picture Credit: <https://rukminim1.flixcart.com/>



### Rama Tulsi or Green Leaf Basil

Rama tulsi is also known as Sri or Lakshmi Tulasi, *Ocimum tenuiflorum*, *Ocimum sanctum*, and green leaf tulsi (Basil). The Rama tulsi emits a strong aroma from its every part. Rama tulsi is widely famous for its cooling taste.

Picture Credit: <https://www.amazon.in/>

### Vana Tulsi or Wild Leaf Basil

The third one from the four different types of tulsi is Vana tulsi. The scientific name of Vana tulsi is *Ocimum gratissimum*. It can grow up to 2m high with highly aromatic and slightly hairy green leaves. The strong antioxidant activity of Vana tulsi slows down the ageing process.



## NUTRITIONAL VALUE

Tulsi leaves are rich in vitamins A, C and K and minerals like calcium, magnesium, phosphorus, iron and potassium. It also has a good amount of protein and fibre. In traditional Indian or Ayurvedic medicine, the most useful parts of the tulsi plant include the leaves, roots, stem, flowers and even the oil. The leaves and roots are often used for medicinal purposes, but many parts of the plant also have non-medicinal uses.

### Chemical Constituents

- Tulsi contains Volatile oil
- The oil contain about
  - 70% Eugenol
  - 20% methyl - Eugenol
  - $\beta$  - Caryophyllene
  - Carvacrol
  - Cineole
  - Linalool



Fig.40.4 Tulsi plant

Picture Credit: <https://images.app.goo.gl/>



## GLOSSARY

1. erect -A stem that stands, having a vertical or upright habit
2. aromatic- having a pleasant and distinctive smell
3. volatile-easily evaporated at normal temperatures
4. lamiaceae- formerly called Labiatae, the mint family of flowering plants
5. perennial- living for several years
6. steam distillation- distillation of a liquid in a current of steam
7. cosmopolitan-found all over the world

## ACTIVITY

1. Find out the type of Tulsi grown in botanical garden and your home. Write the colour of leaves and try to identify it with the help of its taste and smell.

## Let us Recall

### A. Choose the correct option.

1. Tulsi with green leaves is commonly known as
  - a. Rama tulsi
  - b. Shyam tulsi
  - c. Krishna tulsi
  - d. All of the above
2. Tulsi is described as queen of herbs because of
  - a. Medicinal qualities
  - b. Non medicinal qualities
  - c. Traditional qualities
  - d. None of the above

### B. Fill in the blanks using the help words given in the box.

Rama tulsi	Krishna tulsi	leaves	stalk	entire plant
queen of plant	lemongrass	vitamin A		vitamin C

1. The part/s of the tulsi plant that is/are used for distillation is/are \_\_\_\_\_.
2. Tulsi leaves are rich in vitamins \_\_\_\_\_.
3. Due to its perceived medicinal qualities, it is also called \_\_\_\_\_.
4. \_\_\_\_\_ is widely famous for its cooling taste.

### C. State whether the following statements are true or false. Correct the false statement.

1. Krishna tulsi got its name because of his beloved plant. \_\_\_\_\_
2. It is holy herb and that is why it is also called queen of herbs. \_\_\_\_\_
3. The entire plant is used for medicinal purpose. \_\_\_\_\_

## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

## **CHAPTER 3- BENEFITS AND IMPORTANCE OF TULSI**

**Learning objective-** Students will understand the importance and uses of Tulsi

**Learning outcome-** Students will include Tulsi in different recipes.

### **TULSI – THE WONDER HERB**

The holy basil plant is widely used in Ayurvedic and traditional medicine. Not only this, it is also often used to make herbal tea for a variety of ailments. Tulsi is considered sacred in Hinduism. It is also used as a culinary herb.



Some variety is also used in Thai cuisine is referred to as Thai holy basil and is the key herb in Phat kaphrao, a stir-fry dish.

Besides these it also used as an insect repellent. For centuries, the dried leaves of tulsi have been mixed with stored grains to repel insects.

The essential oil has nematicidal properties and is also used as a disinfection agent as it has an ability to destroy microorganisms that might carry disease.

Essential oils and aromatic chemicals present in tulsi are used in perfumery, cosmetic industries and also in indigenous systems of medicine. Tulsi is also a potent herb that has many health benefits and cures many ailments. There are many diseases that can affect people again after it has left the person. But with the consumption of Tulsi, you can be sure that these diseases cannot affect you.

Tulsi has antibiotic and anti-bacterial properties thus tulsi is very beneficial to treat skin disorders like ringworm, pimples, and itching which are caused either because of bacteria or fungi. So can we say tulsi is not only anti-bacterial but it contains anti-fungal properties.

Not only this it is also used to control high blood pressure and cholesterol which are the major causes of heart related problems making it one of the best heart-healthy foods.

It improves the digestive system which again helps in proper digestion and absorption of nutrients from the food that we need.

Tulsi is also a rich source of vitamin A, C and zinc. It thus acts as a natural immunity booster and keeps infections at bay. We can take tulsi leaves extract to increase WBCs in the blood thus boosting the immune system to fight the diseases.

The juice of the Rama tulsi leaves along with ginger and honey gives relief from cold, fever, asthma and cough. It is also good for diabetes as it regulates high sugar levels in the blood. As it possesses hypoglycaemic properties. It is recommended to include tulsi in your diabetic diet plan.

Do you know what is hypoglycemia, it is another name for lower blood sugar levels, so a person who is diabetic means if they have high blood sugar should definitely include tulsi in their diet as it will help them to control the sugar level in their blood.

It decreases the level of uric acid in the body, which is the main reason why kidney stones are formed. Reduction in uric acid levels also provides relief to patients suffering from Gout.

Do you know what uric acid is? it is waste that is excreted through our urine. But if our body is producing it in excess, our kidneys won't be able to excrete it and thus it will make stones in the kidney and this also gets deposited in our joint and lead to arthritis.

Tulsi has often been used in herbal toothpaste and that is simply because of its amazing teeth and gum strengthening properties. Moreover, it can act on mouth ulcers and therefore provide complete oral health care.

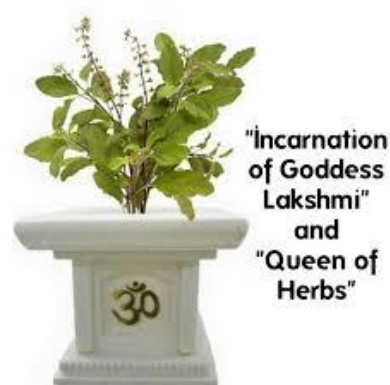
Research has also shown that tulsi has several physical and mental health benefits. For instance, consuming a tulsi drink after a tiring day help to relieve stress and fatigue. Similarly, a tulsi drink during prolonged hours of study can also help to enhance concentration for students. For centuries, dried tulsi leaves have been mixed with stored grains to repel insects.



Apart from simply repelling insects, the extracts of tulsi leaves can also be applied to insect bites and stings to ease the pain. They also reduce swelling or irritation to a great extent.

Moreover, daily consumption of tulsi also helps to purify the blood.

## SIGNIFICANCE IN HINDUISM



Picture Credit: <https://images.app.goo.gl/>



Picture Credit: <https://images.app.goo.gl/>



Picture Credit: <https://images.app.goo.gl/>

Tulsi has a special place in Ayurveda as well as considered sacred by Hindus and worshipped by them.

It is worshipped as the avatar of Lakshmi and may be planted in front yards of Hindu houses or Hanuman temples. The ritual lighting of lamps each evening during the holy month of Kartik includes the worship of the tulsi plant.

Tulsi Vivah is a ceremonial festival performed between the period of Prabodhini Ekadashi (the 11th or 12th lunar day of the bright fortnight of the Hindu month of Kartik) and Kartik Pournima (the full moon of the month).



## GLOSSARY

1. folk medicine-medicine using herbal and other remedies based on traditional beliefs
2. Sacred- connected with God or a god or dedicated to a religious purpose
3. culinary-of or for cooking
4. pungent-having a sharply strong taste or smell
5. nematocidal- able or tending to kill nematodes
6. gout- a disease in which defective metabolism of uric acid causes arthritis
7. fatigue- extreme tiredness

## ACTIVITY

1. List all the health benefits of tulsi.
2. Will you include tulsi in your diet? Share a recipe where you have used tulsi herb. How did it taste?

## Let us Recall

### A. Choose the correct option.

1. It is recommended to include tulsi in your diabetic diet plan because of its .....
  - a. Hyperglycaemic property
  - b. Hypoglycaemic property
  - c. Both a and b
  - d. None of the above
2. Tulsi is also used to control .....
  - a. High BP
  - b. Cholesterol
  - c. Uric acid
  - d. All of the above
3. Kidney stones and gout is caused due to accumulation of.....
  - a. uric acid
  - b. urea
  - c. ammonia
  - d. glucose

### B. Fill in the blanks using the help words given in the box.

Lakshmi	Krishna	fish fry	increase	decrease
---------	---------	----------	----------	----------

1. Tulsi is worshipped as an avatar of \_\_\_\_\_ .
2. Thai holy basil is the key herb in \_\_\_\_\_.
3. Tulsi leaves extract is given to \_\_\_\_\_ WBCs thus, boosting the immune system of our body.

### C. State whether the following statements are true or false. Correct the false statement.

1. Tulsi helps to purify the blood. \_\_\_\_\_
2. Tulsi controls high blood pressure and cholesterol thus making it one of the best heart-unhealthy foods. \_\_\_\_\_
3. The dried tulsi leaves have been mixed with stored grains to attract useful insects. \_\_\_\_\_

## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

## CHAPTER 4- LET'S GROW TULSI

**Learning objective-** Students will learn what is propagation and steps to propagate tulsi.

**Learning outcome-** students will learn how to grow tulsi.

Tulsi is a demanding plant due to its medicinal properties. The holy basil crop is planted in the month of April & May and it can be sown by two methods of seeds and plants.

### Method 1

#### HOW TO GROW TULSI FROM SEEDS?

**1. Fill a flower pot with high quality soil and water it thoroughly.** You should leave about an inch (2.54 cm) of space at the top of the pot. Add enough water to make the soil very moist, but don't add too much water, because you don't want the soil to be soggy.



Picture Credit: <https://images.app.goo.gl>

**2. Sow the seeds ¼ inch (0.64 cm) beneath the soil.** Because tulsi seeds are so small simply sprinkle the seeds on top of the soil, then gently press them down into the surface using your fingers or a small tamper.



Picture Credit: <https://images.app.goo.gl>

**3. Keep the soil moist until the seeds germinate.** The seeds will begin to grow in about 1-2 weeks. Because the seeds are so delicate, try using a spray bottle to mist the surface of the soil. If you are pouring water into the pot, do so slowly and carefully so you don't disrupt the seeds.



Picture Credit: <https://images.app.goo.gl>

Covering the top of the flower pot with plastic wrap will help seal in moisture, but you will still need to check the soil and add more water if needed.



Picture Credit: <https://images.app.goo.gl>

**4. Place the tulsi plant near a warm, sunny window.** Your plant requires 6-8 hours of sunlight a day and temperatures of at least 70 °F (21 °C). Set the pot in an area where it can receive plenty of indirect sunlight.

Be careful not to leave the plant near open windows or doors if the temperature cools down overnight.

### Method 2

#### Rooting Tulsi in Water



Picture Credit: <https://images.app.goo.gl>

**1. Cut a 4-6 inch (10-15 cm) stem from a mature tulsi plant.** Remove the stem right below a set of leaves. Pluck all the other leaves from the bottom portion of your cutting. When cutting the stem, be sure to select one that hasn't flowered yet. You can take a cutting from a flowering stem, but it will be more difficult to root and makes it more difficult for the plant.

**2. Place the tulsi cutting in a glass container filled with water.** Use a clear drinking glass and fill it with enough water to cover just the bottom half of the stems. You can place more than 1 stem in the container, just be sure it is not overcrowded.

Change the water every day so the stems don't rot from an overgrowth of bacteria.

**3. Put your tulsi plant in a warm, sunny spot.** Choose a windowsill or table that will allow the plant to get at least 6-8 hours of bright, indirect sunlight.



Picture Credit: <https://images.app.goo.gl>

**4. Transfer the cuttings to a pot of soil when the roots begin to grow.** Your cutting will be

ready to transfer to the soil when its roots are  $\frac{1}{4}$ –

$\frac{1}{2}$  inch (0.64–1.27 cm) long. It can take between 7 and 10 days to reach this point. Keep the Tulsi in the potting soil for 2-3 weeks before planting outdoors if you choose to.



Picture Credit: <https://images.app.goo.gl>

## SOME IMPORTANT CARE TIPS

1. Pinch off the growing tip of your Tulsi if you wish to grow a bushy plant rather than a single stem.
2. Keep removing the new flowering heads, don't let your plant flower early, and delay the Tulsi flowering as much as you can to keep your plant green, leafy & bushy.
3. Always keep the pot aerated by loosening the soil, don't let the soil get all compact & hard.
4. When grown in poor conditions it might be attacked by some common pests like mealy bugs, aphids, spider mites and sometimes whiteflies. For treating pests use Neem-based organic pesticide or insecticidal soap.

## REQUIREMENTS FOR GROWING THE HOLY BASIL

Requirements for growing the holy basil are very similar to the sweet basil although, it's just more drought and heat tolerant.

### Soil

Tulsi grows well in loamy and fertile soil with good drainage. It can be planted in slightly acidic, neutral to slightly alkaline soil pH, a level around 6 to 7.5 is optimal.

### Sun

Holy basil thrives in full sun but grows in partial shade too, at least four hours of sunlight a day is required for the best growth.

### Water

Water the plant when the top one inch of soil is dry, but in summer, keep the soil slightly moist. Do not water during rain. Reduce watering in the winter to prevent diseases.

## NUTRIENTS, FERTILIZERS AND MANURE REQUIRED



Picture Credit: <https://www.amazon.in/>

Feed your basil plants with a good organic fertilizer every four to six weeks for indoor plants and every 2-3 weeks for outdoor. A well-balanced fertilizer with equal amounts of nitrogen, potassium, and phosphate, will help to boost leaf production. Cow dung manure and Epsom salt are



Picture Credit: <https://images.app.goo.gl>

the best fertilizers for the tulsi plant. To make the fertilizer of Epsom salt, mix one tablespoon of Epsom Salt with about 4 liters of water. Spray it on the leaves of the plant once every two weeks. In the case of application on vegetables, sprinkle a tablespoon of Epsom salt around each seedling as soon as they are transplanted to a pot.

Rice water can be very beneficial to plants as it adds valuable minerals and nutrients to the soil. It helps increase bacterial growth in soil which increases the nutrient content of the soil.



Picture Credit: <https://images.app.goo.gl>

## PESTS AND DISEASES

The holy basil plant is generally free from pests and diseases. However, when grown in poor conditions, it can be attacked by some common pests like mealy bugs, aphids, spider mites, and sometimes whiteflies. For treating pests, use organic pesticides or insecticidal soap.

## WEEDING

The first weeding is done one month after planting, and the second 4 weeks after the first. After this, no further weeding is required as the plants become bushy, thereby naturally suppressing the weeds.



Picture Credit: <https://images.app.goo.gl>

## GLOSSARY

- a. soggy- wet and soft
- b. bushy-growing thickly
- c. aerated- to supply the soil with air
- d. pesticide- a substance used for destroying insects or other organisms harmful to cultivated plants

## ACTIVITY

Grow a tulsi herb by planting a seed and by the cutting method and record your observations by listing:

Date of seed sown  
Type of soil used  
pH of soil  
Temperature  
Humidity

Sunlight duration  
Irrigation practices  
Manure and fertilizers applied date and quantity  
Care taken



## Let us Recall

### A. Choose the correct option.

1. Basil crop is planted in the month of.....
  - a. January and February
  - b. March and April
  - c. April and May
  - d. Only December
2. The minimum sunlight required in a day for the best growth of tulsi is about .....
  - a. 3-4 hrs
  - b. 1-2 hr
  - c. 5-6 hr
  - d. 8 hr

### B. Fill in the blanks using the help words given in the box.

harvest	germinate	clay	loam	sandy soil	nitrogen
potassium and phosphate		6-8 hrs	10-12hrs		

1. A well-balanced fertilizer with equal amounts of \_\_\_\_\_ is required for best growth of tulsi.
2. Tulsi grows well in \_\_\_\_\_ .
3. Keep the soil moist until seeds of tulsi \_\_\_\_\_
4. Tulsi plant requires \_\_\_\_\_ of sunlight a day

### C. State whether the following statements are true or false. Correct the false statement.

1. Pinch off the growing tip of your tulsi if you wish to grow a bushy plant. \_\_\_\_\_
2. Be careful to leave the plant near open windows or doors if the temperature cools down overnight. \_\_\_\_\_

## **SELF-REFLECTION**

WHAT?	HOW?	WHY?

## **CHAPTER 4- HARVESTING and POST-HARVESTING**

**Learning objective-** Students will learn techniques to harvest and store tulsi.

**Learning outcome-** Students will be able to harvest and store tulsi by using the drying method.

### **HARVESTING AND STORING**



Picture Credit: <https://images.app.goo.gl>

Reap the aromatic leaves of your Tulsi plant throughout the growing season. Once your plant reaches 8 inches in height, take a pair of scissors and, depending on your needs, cut large single leaves or cut the whole branch. Use fresh leaves on the same day you harvest because they fade quickly.

The harvested produce may be allowed to wilt in the field itself for 4-5 hours so as to reduce the moisture and also the bulkiness. However, oil quality and its yield do not diminish up to 6-8 hours after harvest, but further delay may cause considerable loss in yield and quality of the oil.

### **POST-HARVEST**

After harvesting, the drying of leaves is done. Then steam distillation is done to obtain Basil oil. For transportation, it is packed in airtight bags. Leaves should be stored in dry places. Store your holy basil harvest for future use by drying out the leaves in a warm shady place. Collect branches in a basket and place them in a dry place away from sunlight and toss the stem 2-3 times every day until leaves become crispy and collapse when you crush them. Its seeds are also edible and can be stored to add to teas.



Picture Credit: <https://images.app.goo.gl>



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For transportation, it is packed in airtight bags. Leaves should be stored in dry places.

Several products like Panch Tulsi oil, Tulsi Powder, Tulsi Tea and Tulsi Capsules are made after processing.



Picture Credit: <https://images.app.goo.gl>



Picture Credit: <https://www.amazon.in>

## WARNING

Do not wash your holy basil after harvesting. The herb will start to rot if you get it wet. If your holy basil plants need to be washed, then do it one or two days before cutting while the sprigs are still on the plant in the garden. This will give the holy basil time to naturally dry off before harvest.

## HOW TO CONSUME TULSI?

Tulsi is commonly consumed in herbal teas and masala chai. You can also add it to soups and smoothies.

- Consume Tulsi leaves raw, plucked fresh from the plant, add it to your tea or make kadha out of it.
- Tulsi tea: To make tulsi tea, boil 1 cup of water and pour it over 1 tsp of fresh tulsi leaves, 1/2 tsp of dried tulsi leaves or 1/3 tsp of tulsi powder. Cover the water in a pot or mug and let it steep for 15-20 minutes. Then strain the leaves, add honey if desired and enjoy.
- Tulsi powder and supplements are also available in the market for consumption.

## SOME SIDE EFFECTS OF CONSUMING TULSI THAT YOU MUST KNOW

- Some people experience nausea or diarrhoea when they first add tulsi tea to their diet, so it is best to start with small quantities and increase your consumption over the time.
- Tulsi may lower blood sugar and should be used with caution in people who have diabetes and are on blood-sugar-lowering medication.

## CONTRAINDICATIONS

Holy basil isn't recommended if you're taking anticoagulants (blood thinners). Holy basil can cause relaxation. Don't use it on top of drugs that cause drowsiness.

## Tulsi's Companions

Tulsi is also a strong counterpart to spicy herbs like

- Ginger
- Turmeric
- Cinnamon
- Mint

## GLOSSARY

1. harvest- the process or period of gathering in crops
2. bulkiness-being large in size
3. rot- decay or cause to decay by the action of bacteria and fungi; decompose
4. sprigs- a small stem bearing leaves or flowers, taken from a plant
5. anticoagulants- inhibiting the coagulation of the blood

## Activity

1. Harvest a small portion of tulsi plant and preserve it by drying. Maintain its record datewise.

## Let us Recall

### A. Choose the correct option

1. Oil quality and its yield of tulsi do not diminish up to \_\_\_\_\_ after its harvest.
  - a. 6-8 hours
  - b. 8-9 hours
  - c. 1-2 hours
  - d. 24 hours
2. Steam distillation is done to obtain oil from \_\_\_\_\_ .
  - a. Leaves
  - b. Stem
  - c. Flowers
  - d. Seeds

### B. Fill in the blanks using the help words given in the box.

queen of herbs, Lamiaceae, lemon, clove, 10 hr, 4-5hrs, moisture

1. The holy herb is also called \_\_\_\_\_.
2. It belongs to the family \_\_\_\_\_.
3. The taste of tulsi is like \_\_\_\_\_.
4. The harvested produce may be allowed to wilt in the field itself for \_\_\_\_\_ hours to reduce the \_\_\_\_\_.

### C. State whether the following statements are true or false. Correct the false statement.

1. Tulsi herb does not have any side effects. \_\_\_\_\_
2. Tulsi leaves are dried in oven to make powder. \_\_\_\_\_
3. Tulsi herb should not be washed after harvesting. \_\_\_\_\_



## **SELF-REFLECTION**

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